UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 8520

MSAS NO. 110

OVER THE

MINNESOTA RIVER

DISTRICT 7 - BROWN COUNTY, CITY OF NEW ULM

PREPARED FOR THE

MINNESOTA DEPARTMENT OF TRANSPORTATION

BY

COLLINS ENGINEERS, INC.

JOB NO. 5221 (CEI 129)

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The concrete surfaces of the substructure units inspected at Bridge No. 8520, Piers 1 through 3, were found to be in good condition with no defects of structural significance observed. A moderate accumulation of timber debris was observed at the upstream end of Pier 1. In addition, Pier 1 exhibited footing exposure with up to 4 feet of vertical face exposure along the east face of the pier, representing an increase by approximately 1 foot since the pervious inspection. There was also up to 1.5 feet of vertical exposure for the footing at Pier 3 which was located in a scour depression on the easterly bank. Other than the increased footing exposure at Pier 1 and the scour around Pier 3, the channel bottom appeared stable with no appreciable changes since the previous inspection.

INSPECTION FINDINGS:

(A) A moderate accumulation of timber debris, which included pieces up to 12 inches in diameter, was observed from the channel bottom to 5 feet above the channel bottom at the upstream nose and extending along both faces of Pier 1 to the upstream quarter points of the shaft.

(B) The top of the footing was exposed at Pier 1 from the upstream quarter point on the west face, around the upstream nose, and along the entire east face with up to 4 feet of vertical face exposure along the east face.

(C) Pier 3 exhibited footing exposure around the majority of the pier with up to 1.5 feet of vertical face exposure due to a scour depression 10 feet in radius within the easterly bank.

(D) A scour depression 6 feet in radius, 2 feet deep was observed at the upstream noses of Piers 1 and 2.

RECOMMENDATIONS:

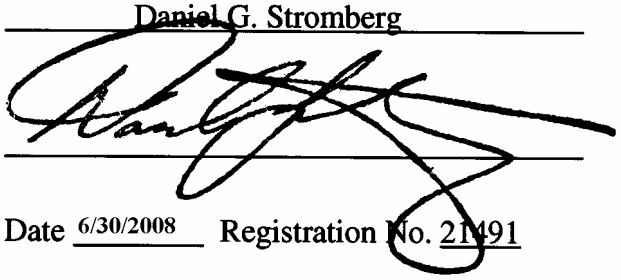
(A) Monitor the timber debris at Pier 1, and if found to be increasing in the future, removal operations may become warranted.

(B) Because the bridge has been evaluated to be scour critical, monitor the pier footing exposures and the extent of scour during high flows and also during future inspections, and if found to be increasing, countermeasures may become warranted.

(C) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years unless a period of high flow creates the need for a sooner inspection.

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

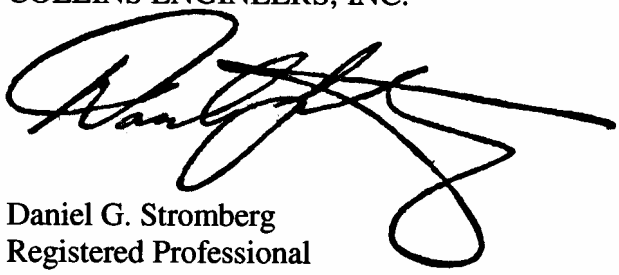
Daniel G. Stromberg



Date 6/30/2008 Registration No. 21491

Respectfully submitted,

COLLINS ENGINEERS, INC.



Daniel G. Stromberg
Registered Professional
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 8520

Feature Crossed: Minnesota River

Feature Carried: 20th Street (MSAS No. 110)

Location: District 7 - Brown County, City of New Ulm

Bridge Description: The superstructure consists of multiple steel beams over four spans. The superstructure is supported on two reinforced concrete abutments and three reinforced concrete piers. The pier and abutment footings are supported on steel piles. The piers are numbered 1 through 3 starting at the west end of the bridge.

2. INSPECTION DATA

Professional Engineer/Team Leader: Daniel G. Stromberg, P.E., S.E.

Dive Team: Clayton G. Brookins, Valerie Roustan

Date: October 22, 2007

Weather Conditions: Partly Cloudy, 48°F

Underwater Visibility: 1.0 foot

Waterway Velocity: 1.0 f.p.s.

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1, 2, and 3

General Shape: Rectangular pier shafts with rounded noses that rest on rectangular footings founded on steel piles.

Maximum Water Depth at Substructure Inspected: Approximately 16.6 feet.

4. WATERLINE DATUM

Water Level Reference: The top of the pier cap on the south end of Pier 2.

Water Surface: The waterline was approximately 19.9 feet below reference.
Waterline Elevation = 792.3.

5. NBIS CODING INFORMATION (Minnesota specific codes are used for 92B and 113)

Item 60: Substructure: Code 7

Item 61: Channel and Channel Protection: Code 6

Item 92B: Underwater Inspection: Code B/10/07

Item 113: Scour Critical Bridges: Code R/95

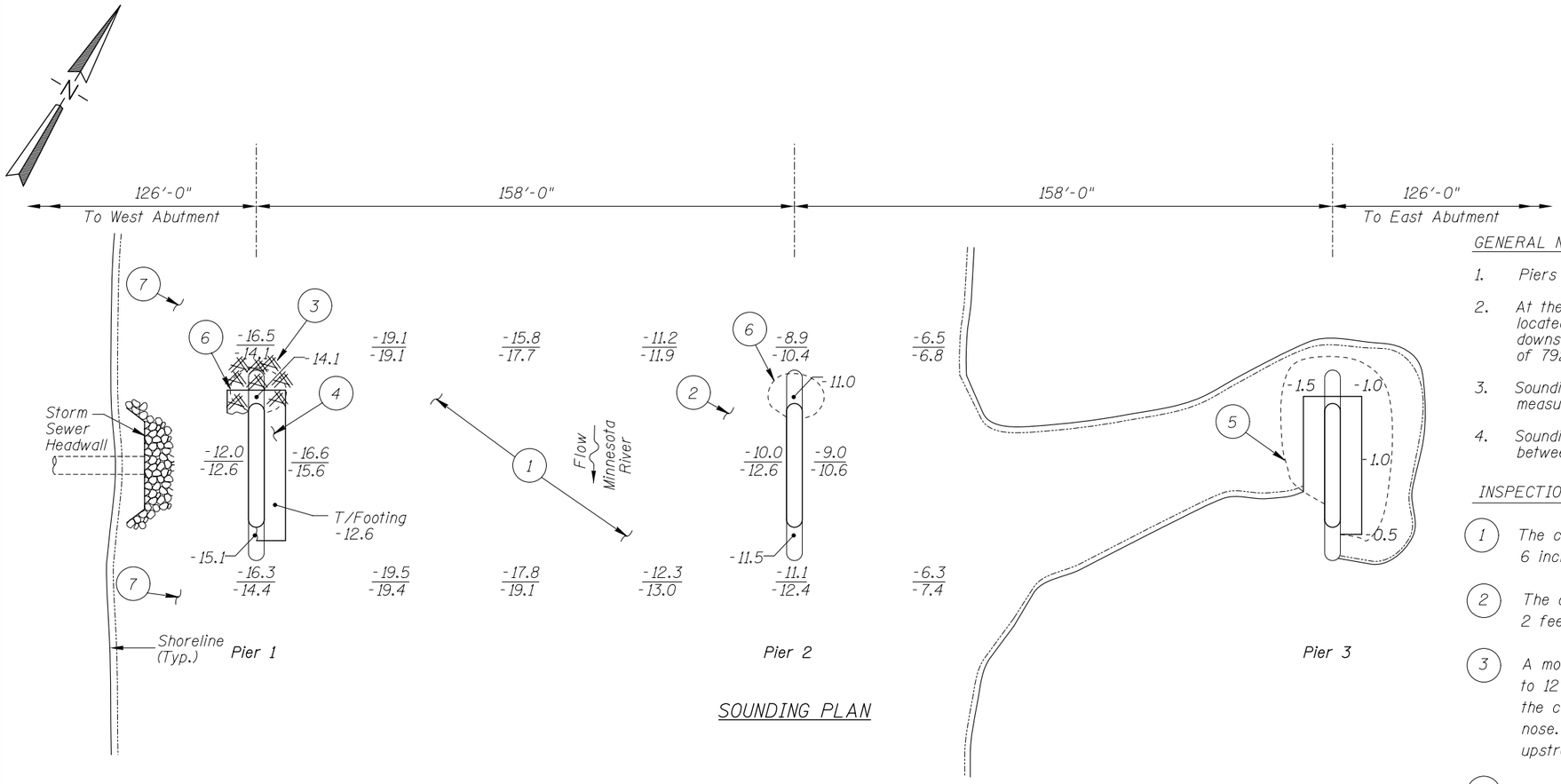
Bridge is scour critical because abutment or pier foundation is rated as unstable due to observed scour at bridge site.

X Yes _____ No

Photograph 1. View of Pier 1, Looking Northeast.


Photograph 2. View of Pier 2, Looking Southeast.

Photograph 3. View of Pier 3, Looking Southwest.



SOUNDING PLAN

GENERAL NOTES:

1. Piers 1 through 3 were inspected underwater.
2. At the time of inspection on October 22, 2007, the waterline was located approximately 19.9 feet below the top of the pier cap at the downstream end of Pier 2. This corresponds with a waterline elevation of 792.3.
3. Soundings indicate the water depth at the time of inspection and are measured in feet.
4. Soundings were taken parallel to the bridge at 1/4 point intervals between the substructure units.

INSPECTION NOTES:

(1) The channel bottom consisted of firm gravel and riprap, typically 6 inches in diameter, with up to 2 inches of probe rod penetration.

(2) The channel bottom around Pier 2 consisted of soft silt with up to 2 feet of probe rod penetration.

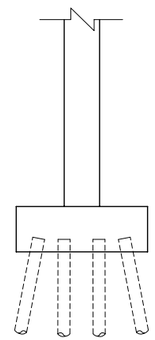
(3) A moderate accumulation of timber debris, which included pieces up to 12 inches in diameter and formwork remains, was observed from the channel bottom to 5 feet above the channel bottom at the upstream nose. Scattered pieces were also found along both faces of Pier 1 to the upstream quarter point of the shaft.

(4) The top of the footing was exposed at Pier 1 from the upstream quarter point on the west face, around the upstream nose, and along the entire east face with up to 4 feet of vertical face exposure along the east face.

(5) The top of the footing was exposed at Pier 3 around the majority of the pier with up to 1.5 feet of vertical face exposure due to a scour depression 10 feet in radius.

(6) A scour depression 6 feet in radius, 2 feet deep was observed at the upstream noses of Piers 1 and 2.

(7) Vertical bank erosion was observed upstream and downstream of the structure along the west embankment.



TYPICAL END VIEW OF PIERS

Note:

All soundings based on 2007 waterline location.

Legend

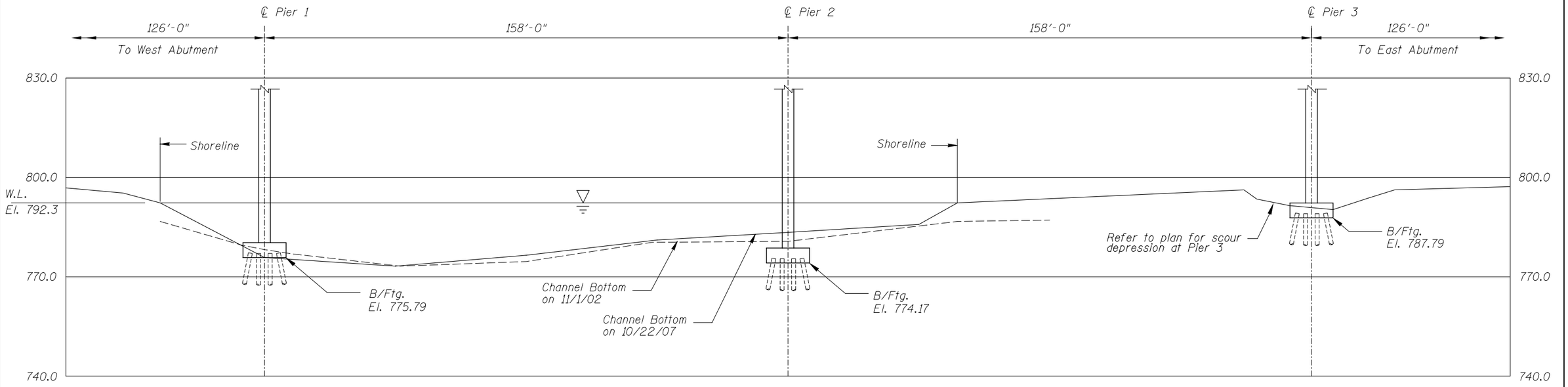
-2.0 / -5.2	Sounding Depth (10/22/07) / Sounding Depth (11/1/02)
	Riprap
	Dry Scour Depression
	Timber Debris

MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

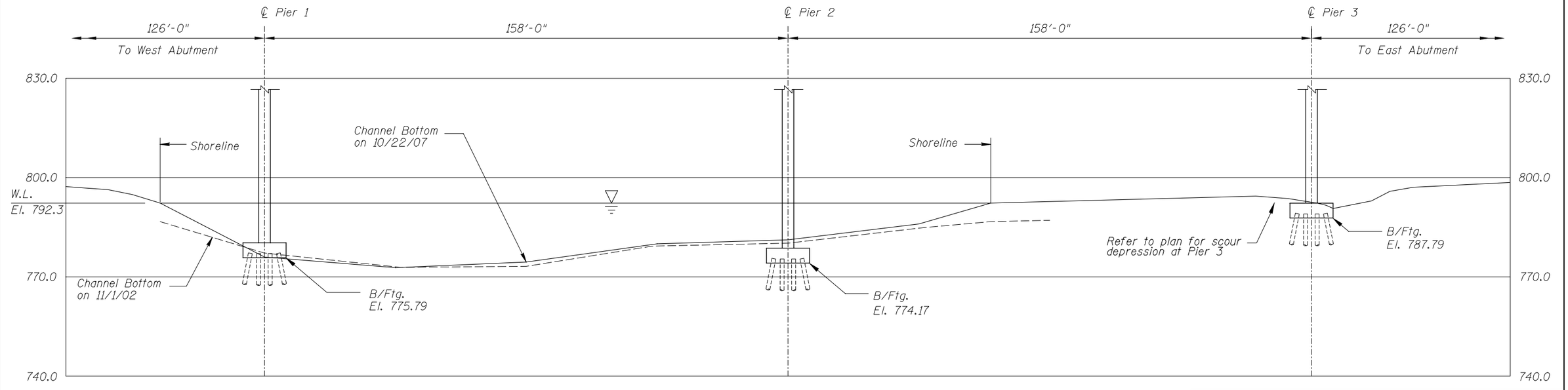
STRUCTURE NO. 08520
OVER THE MINNESOTA RIVER
DISTRICT 7, BROWN COUNTY, CITY OF NEW ULM

INSPECTION AND SOUNDING PLAN

Drawn By: LJ	COLLINS ENGINEERS INC 123 North Wacker Drive Suite 300 Chicago, Il. 60606 (312) 704-9300 www.collinsengr.com	Date: OCT. 2007
Checked By: VR		Scale: NTS
Code: 52210129		Figure No.: 1



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:

Refer to Figure 1 for General Notes.

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UNDERWATER BRIDGE INSPECTION

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UPSTREAM AND DOWNSTREAM FASCIA PROFILES

Drawn By: LJ	COLLINS ENGINEERS, INC. 123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-0300 www.collinsengr.com	Date: OCT. 2007
Checked By: VR		Scale: 1"=30'
Code: 52210129		Figure No.: 2

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES
DAILY DIVING REPORT

INSPECTORS: Collins Engineers, Inc. DATE: October 22, 2007

ON-SITE TEAM LEADER: Daniel G. Stromberg, P.E., S.E.

BRIDGE NO: 8520 WEATHER: Partly Cloudy, 48°F

WATERWAY CROSSED: Minnesota River

DIVING OPERATION: X SCUBA _____ SURFACE SUPPLIED AIR

_____ OTHER _____

PERSONNEL: Clayton G. Brookins, Valerie Roustan

EQUIPMENT: Scuba, U/W Light, Scraper, Sounding Pole, Lead Line, Probe Rod, Camera

TIME IN WATER: 8:50 a.m.

TIME OUT OF WATER: 9:20 a.m.

WATERWAY DATA: VELOCITY 1.0 f.p.s.

VISIBILITY 1.0 foot

DEPTH 16.6 feet maximum at Pier 1

ELEMENTS INSPECTED: Piers 1, 2, and 3

REMARKS: Overall, the concrete of the pier shafts was in good condition with no structurally significant defects observed. The footing at Pier 1 was exposed from the upstream quarter point along the west face, around the upstream nose, and along the entire east face with up to 4 feet of vertical face exposed along the east face. There was also a moderate accumulation of timber debris, with pieces up to 12 inches in diameter, observed at the upstream nose and along the upstream side of both faces of Pier 1. A scour depression 6 feet in radius, 2 feet deep was observed at the upstream nose of Piers 1 and 2. The top of the footing was exposed at Pier 3 around the majority of the pier with up to 1.5 feet of vertical exposure due to a scour depression 10 feet in radius within the easterly bank of the waterway.

FURTHER ACTION NEEDED: ___X___ YES _____ NO

Monitor the timber debris at Pier 1, and if found to be increasing in the future, removal operations may become warranted.

Because the bridge has been evaluated to be scour critical, monitor the pier footing exposures and the extent of scour during high flows and also during future inspections, and if found to be increasing, countermeasures may become warranted.

Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years unless a period of high flow creates the need for a sooner inspection.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 8520
INSPECTORS Collins Engineers, Inc.
ON-SITE TEAM LEADER. Daniel G. Stromberg, P.E., S.E.
WATERWAY CROSSED Minnesota River

INSPECTION DATE October 22, 2007

NOTE: USE ALL APPLICABLE CONDITION DEFINITIONS AS DEFINED IN THE MINNESOTA RECORDING AND CODING GUIDE INCLUDING GENERAL, SUBSTRUCTURE, CHANNEL AND PROTECTION, AND CULVERTS AND WALL DEFINITIONS TO COMPLETE THIS FORM.

CONDITION RATING

			SUBSTRUCTURE						CHANNEL					GENERAL					
UNIT REFERENCE NO.		MAXIMUM DEPTH OF WATER	PILING	COLUMNS, SHAFTS, OR FACES*	FOOTINGS	DISPLACEMENT	OTHER	OVERALL SUBSTRUCTURE CONDITION CODE*	SCOUR	EMBANKMENT EROSION	EMBANKMENT PROTECTION	OTHER (DRIFT/DEBRIS)	OVERALL CHANNEL & PROTECTION CONDITION	CONCRETE	STEEL	TIMBER	LOSS OF SECTION	PREVIOUS REPAIR OR MAINTENANCE	OTHER
	UNIT DESCRIPTION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Pier 1	16.6’	N	7	7	9	N	7	6	6	6	6	6	7	N	N	N	N	N
	Pier 2	11.5’	N	7	N	9	N	7	7	N	N	N	7	7	N	N	N	N	N
	Pier 3	1.5’	N	7	7	9	N	7	6	7	7	N	6	7	N	N	N	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the concrete of the pier shafts was in good condition with no structurally significant defects observed. The footing at Pier 1 was exposed from the upstream quarter point along the west face, around the upstream nose, and along the entire east face with up to 4 feet of vertical face exposed along the east face. There was also a moderate accumulation of timber debris, with pieces up to 12 inches in diameter, observed at the upstream nose and along the upstream side of both faces of Pier 1. A scour depression 6 feet in radius, 2 feet deep was observed at the upstream nose of Piers 1 and 2. The top of the footing was exposed at Pier 3 around the majority of the pier with up to 1.5 feet of vertical exposure due to a scour depression 10 feet in radius within the easterly bank of the waterway.

NOTES: ATTACH SKETCHES AS NEEDED, IDENTIFY REMARK BY REFERRING TO UNIT REFERENCE NO. AND REMARK NO.
USE GENERAL SECTION TO IDENTIFY OVERALL PRESENCE OF SPALLS, CRACKS, CORROSION, ETC.